

Recycled Asphalt Pavement



RAP Expert Task Group

January 10, 2008





PURPOSE

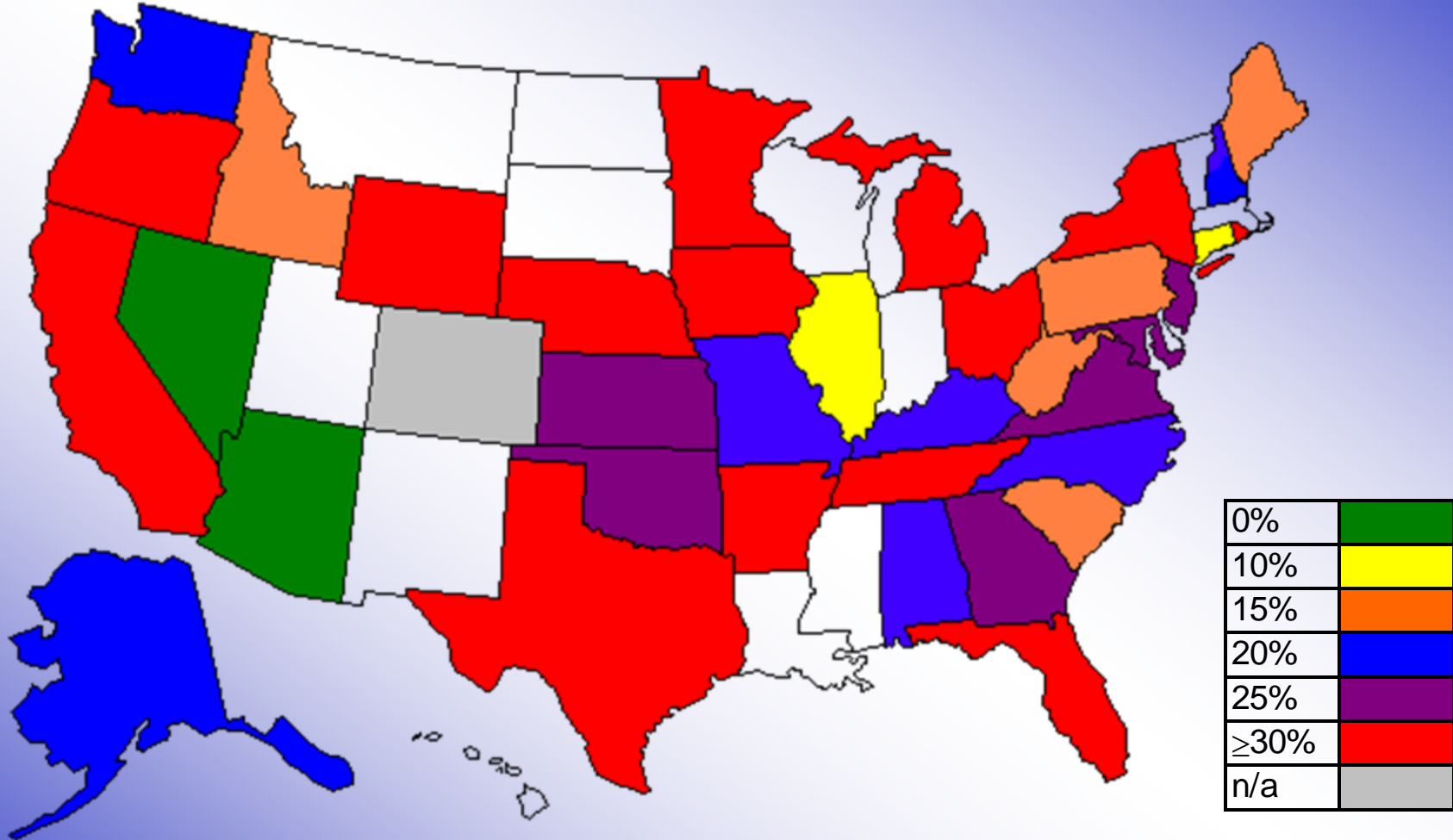
- Increase use of RAP in Hot Mix Asphalt
- Review current state of the art
- Identify who uses RAP
- Transfer information to those who “do not”
- Make recommendations for research



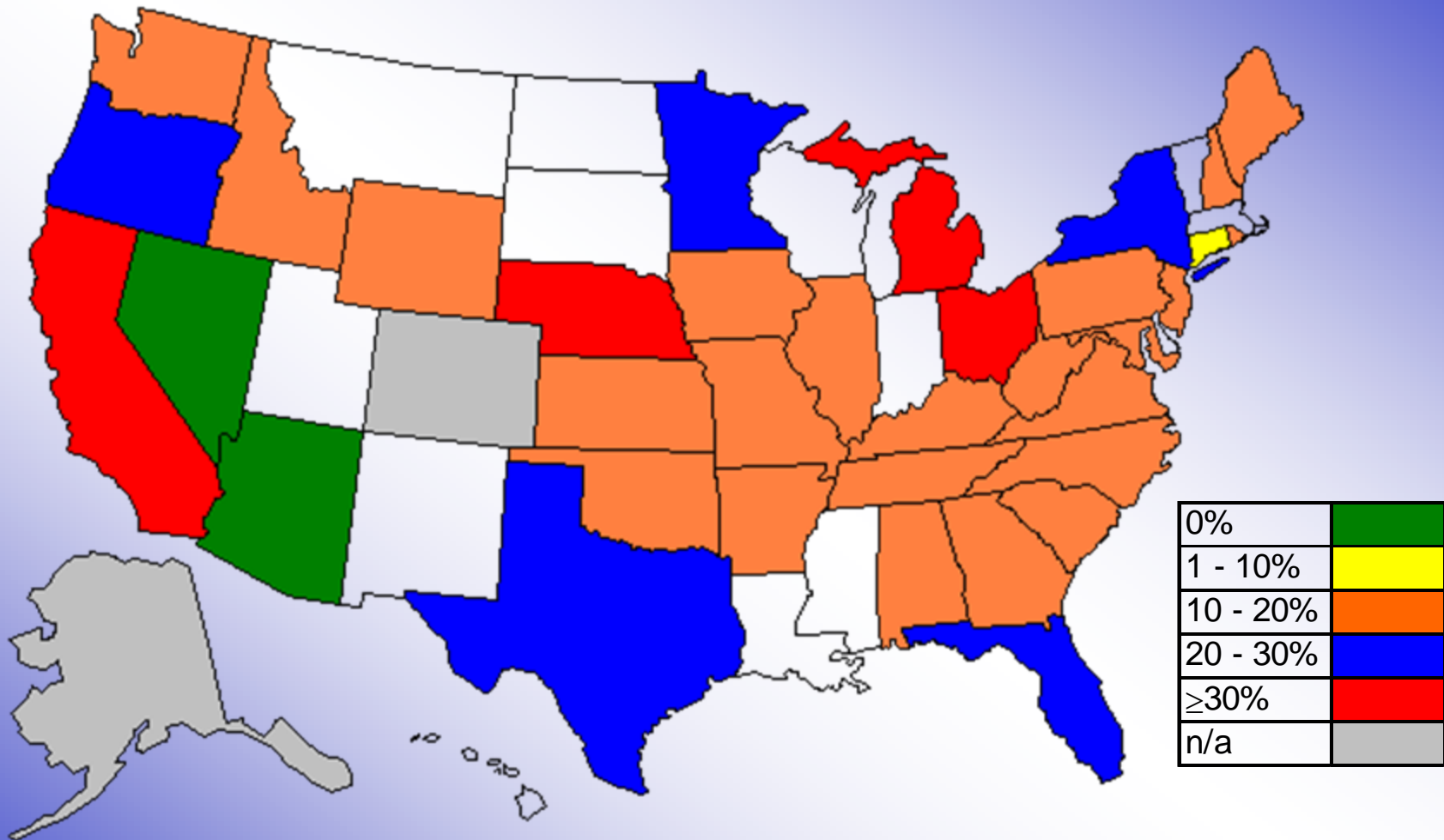
Who is Using RAP?

- Survey of States and Provinces
- Done by AASHTO Subcommittee on Materials
- 38 Responses (Including Ontario)

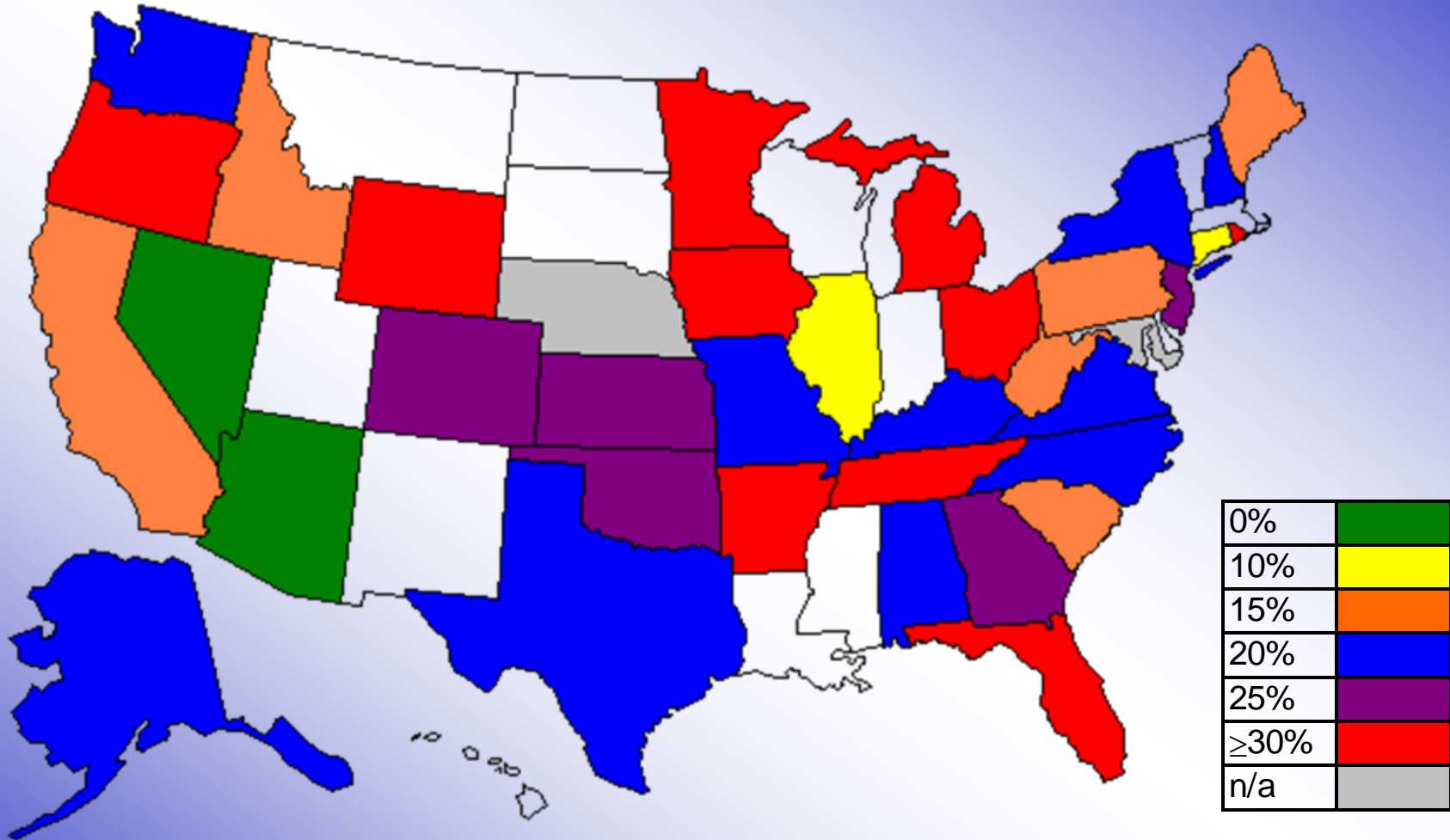
Base— % RAP Allowed by Spec



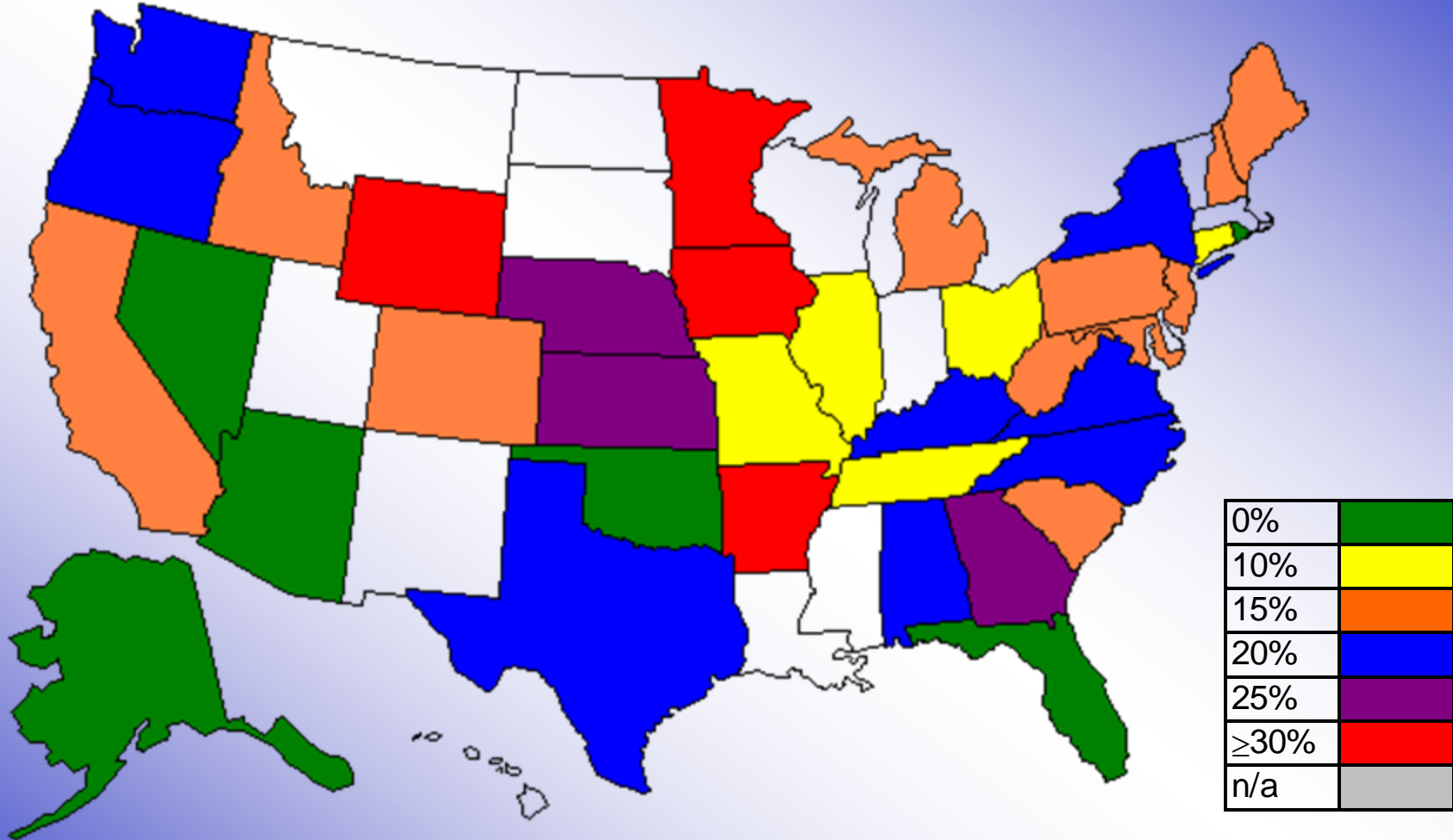
Base Mixes -- Average Use



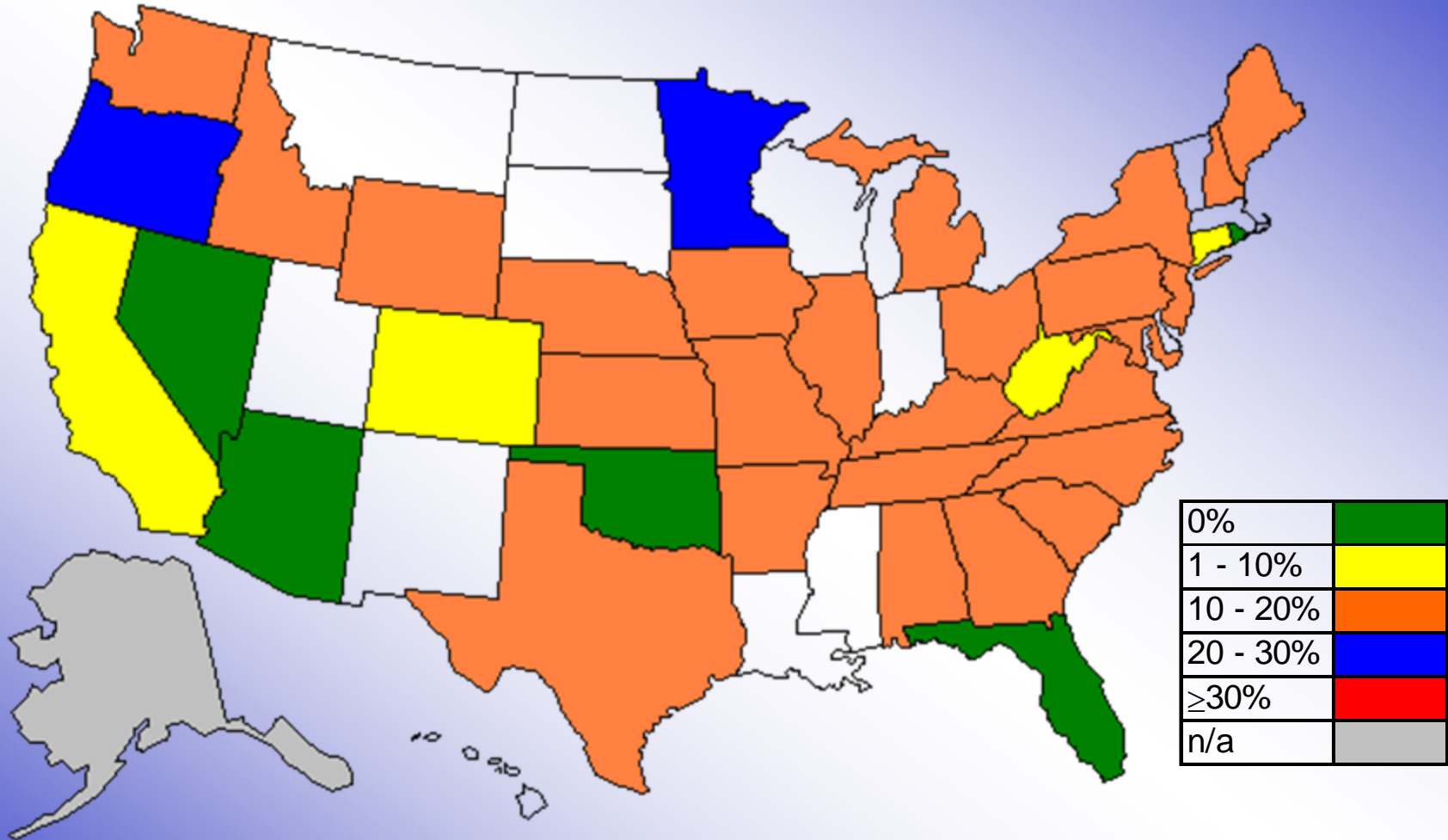
Intermediate - % RAP Allowed by Spec



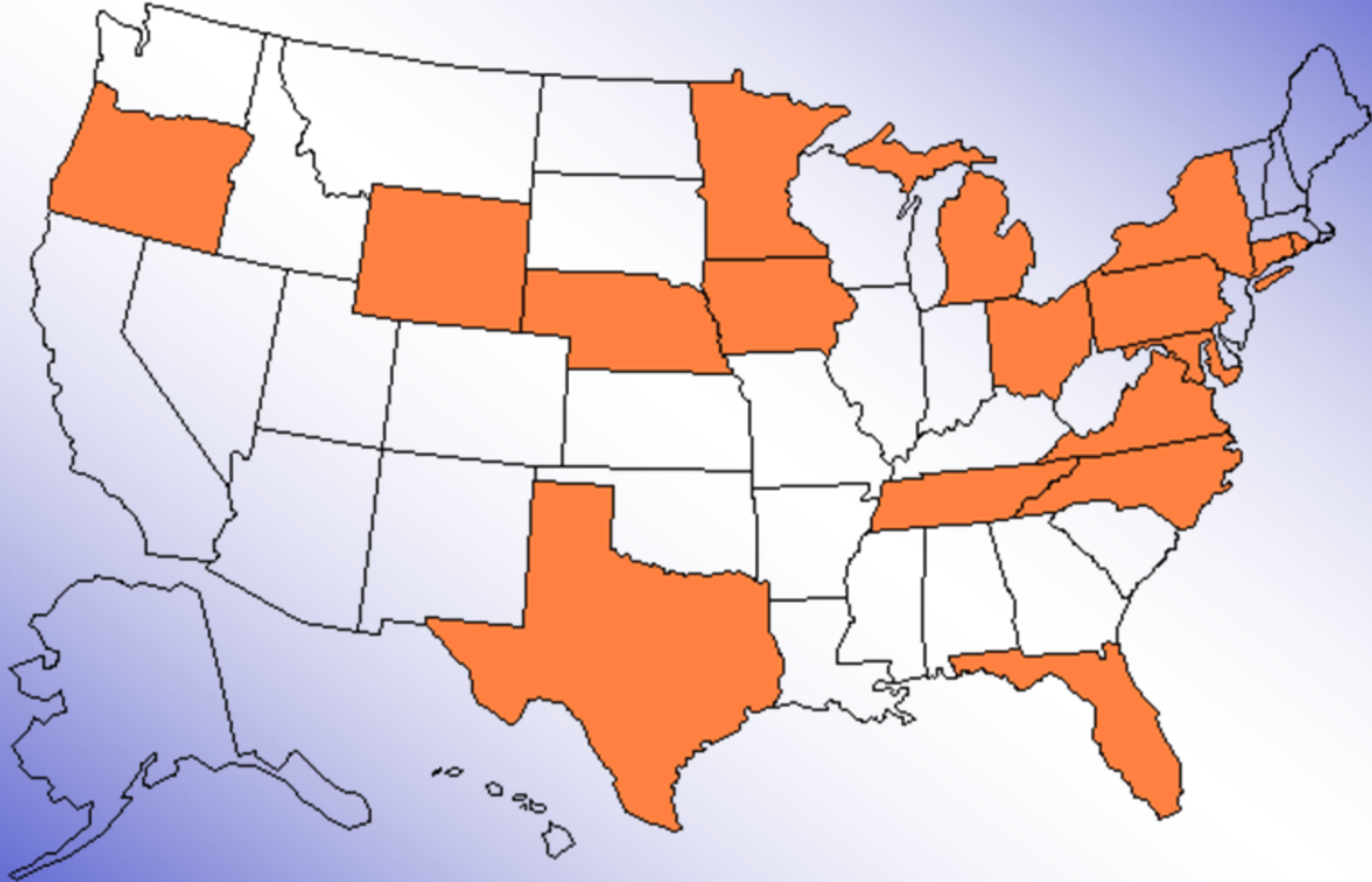
Surface - % RAP Allowed by Spec



Surface Mixes -- Average Use



Recent Experience >25% RAP





Maximum Practical RAP Usage

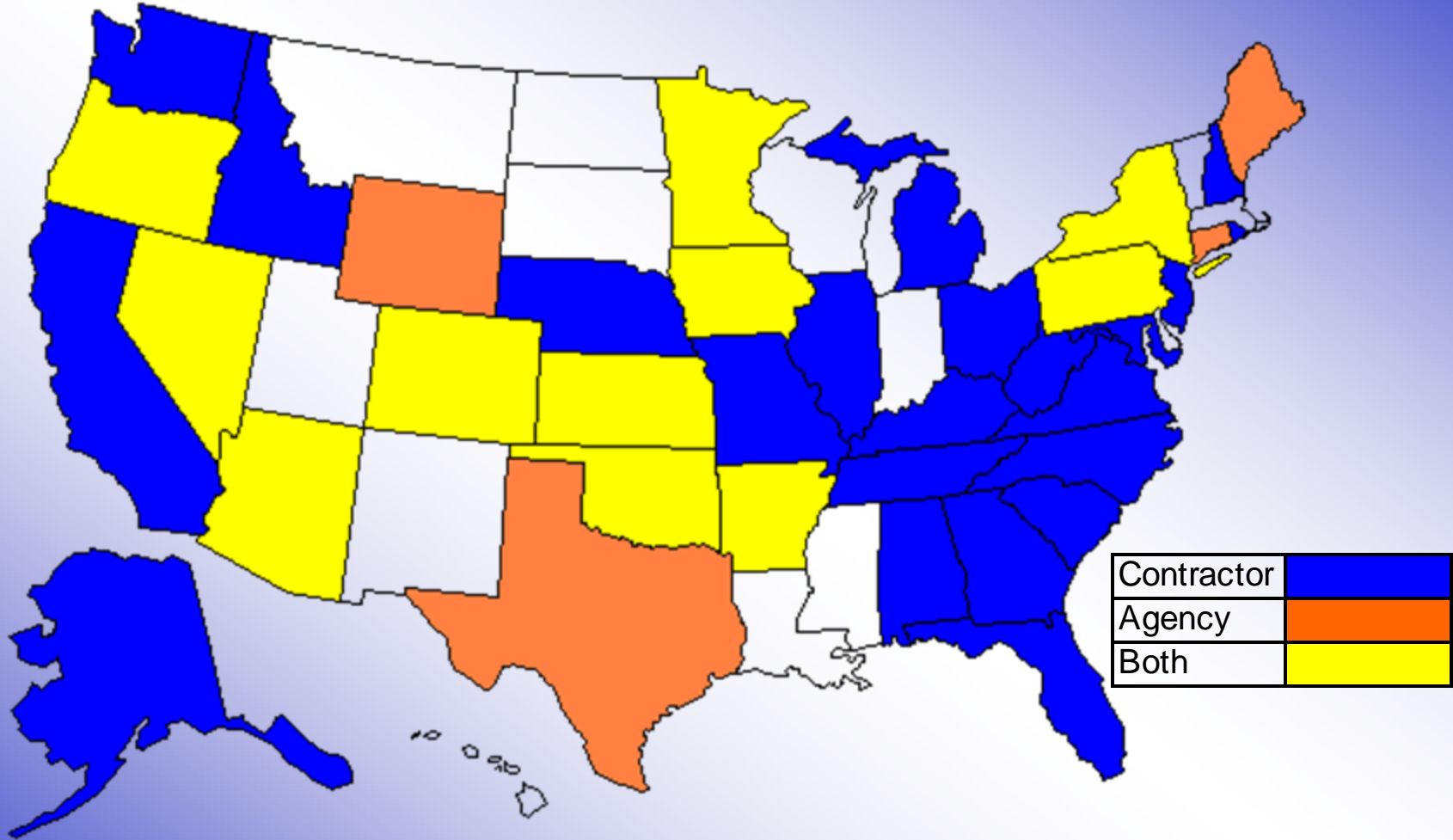
Considerations

- *Mix Design*
- *Customer Specifications*
- *RAP Availability*
- *Plant Type*

<i>Item</i>	<i>Maximum RAP %</i>
<i>Base</i>	35
<i>Intermediate</i>	35
<i>Surface</i>	35*

*Friction requirements on
high-volume roads

Ownership of RAP



RAP Sources

Pavement Milling

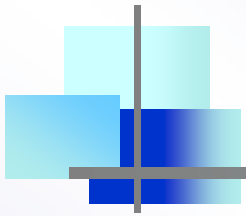


Asphalt Pavement Removal



Plant Waste Material

Recycled Asphalt Pavement Usage



RAP Practice

RAP Stockpile Options



Isolate RAP Sources

Blend Multiple Sources



RAP Processing Options

Screening



Crushing



Fractionating

RAP Process Option 1



***Crush to ½ in.
minus***

Single Stockpile



RAP Process Option 1



***Single Size RAP
minus 1/2 in.***



***Two RAP Bins
(Reduce variability)***

RAP Process Option 2



***Horizontal Impact
Crusher***

***RAP Crushed
and Screened
to Two Sizes
Split on ½ in.***



RAP Size



***Fine
minus ½ in.***



***Coarse
½ to 1 in.***

RAP Process Option 2



Two RAP Bins



RAP Process Option 3



Millings Only

***Control RAP properties
by controlling milling
process***



RAP Process Option 3



***RAP Gator for
Lumps***

One RAP Bin





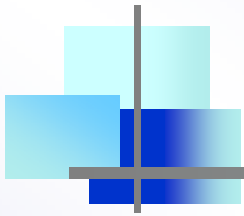
Top Ten Issues

- Best practices manual for
 - Mix design
 - Construction
- Performance test to evaluate RAP
- Method to characterize RAP
 - Avoid hazardous solvents
 - Gradation, Gsb, Pb, and binder grade
- Evaluate binder grade changes
- Co-mingling of RAP and virgin binder unclear
- Document field performance of high rap mixes
- Replicate RAP and virgin plant heating in labs
- Quantify RAP variability
- Processing/fractionating RAP



ETG Next Steps

- Identify Additional Information Needed
- Document Success Stories
- Provide Technology Transfer
- Guide Document for Subcommittee on Materials
- Work with State DoTs
 - Meeting March 5&6 in California



Discussion